

Giardiasis (*Giardia lamblia*)

October 2003

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Giardia lamblia is a flagellate protozoan parasite, which infects primarily the upper small intestine. The parasite exists in both trophozoite and cyst forms. The infective form is the cyst. Infected persons can shed both trophozoites and cysts in stool.

B. Clinical Description and Laboratory Diagnosis

Symptoms may include diarrhea, abdominal cramps, bloating, and frequent loose and pale greasy stools. However, many infections are asymptomatic. The diarrhea can be chronic or intermittent, and can be accompanied by fatigue and steatorrhea (fatty stools). Significant weight loss, failure to thrive and anemia can result in severe cases. The nature of immunity is uncertain. Some people with regular exposure may develop some degree of resistance to illness.

Laboratory diagnosis is based on identification of cysts or trophozoites in the feces, or identification of trophozoites in duodenal fluid or biopsy, detection of parasite antigen by enzyme immunoassay, or detection of parasites by immunofluorescence.

C. Reservoirs

Humans are the primary reservoir for human infections, but *Giardia* can also infect beavers, dogs, cats and other animals. Zoonotic spread does sometimes occur.

D. Modes of Transmission

The principal mode of transmission of giardiasis is person-to-person. Persons become infected by fecal-oral transfer of cysts from the feces of an infected individual, especially in institutions and daycare centers. Transmission can also occur person-to-person through certain types of sexual contact (*e.g.*, oral-anal contact). Localized outbreaks may occur from fecally contaminated water, such as stream/lake waters and swimming pools that are open to contamination by human and animal feces. Eating food contaminated by an infected foodhandler can be a source, but this has been rarely documented.

E. Incubation Period

The incubation period can vary from 3 to 28 days (or longer); the median is 7–10 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes the organism, which may be many months. The asymptomatic carrier rate is high.

G. Epidemiology

Giardiasis has a worldwide distribution. Children are infected more frequently than adults are. Prevalence is higher in areas of poor sanitation and in institutions with children who are not toilet trained, especially daycare centers. Surveys conducted in the United States have demonstrated prevalence rates of *Giardia* in stool specimens that range from 1% to 20%, depending on location and age. Cases occur more commonly in the summer and fall months.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition

CASE CLASSIFICATION

A. CONFIRMED

- Demonstration of *Giardia lamblia* cysts in stool; **OR**
- Demonstration of *Giardia lamblia* trophozoites in stool, duodenal fluid, or small-bowel biopsy; **OR**
- Demonstration of *Giardia lamblia* antigen in stool by a specific immunodiagnostic test (*e.g.*, ELISA).

B. PROBABLE

A clinically compatible case that is epidemiologically linked to a confirmed case by NJDHSS.

C. POSSIBLE

Not used.

B. Laboratory Testing Services Available

The NJDHSS Public Health and Environmental Laboratories (PHEL) provide testing for *Giardia lamblia* on formalinized fecal material using a concentration procedure and iodine stain to identify the presence of cysts. Identification of *Giardia lamblia* cysts and trophozoites from polyvinyl alcohol (PVA) preserved samples is performed using a trichrome staining procedure. There is no charge for analysis performed on outbreak-associated samples approved through the Infectious and Zoonotic Diseases Program (IZDP) or other local health department investigations. However, samples received via other sources will incur a fee for service. Additional information regarding this testing may be obtained by calling the Enteric Laboratory at 609.292.7368.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (*e.g.*, if case-patient is a diapered child, daycare attendee or foodhandler) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (*e.g.*, a restaurant or a contaminated public water supply) and to stop transmission from such sources.

B. Laboratory and Healthcare Provider Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that laboratories report (by telephone, confidential fax, over the Internet using the Communicable Disease Reporting System [CDRS] or in writing) all cases of giardiasis to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the health care provider requesting the laboratory examination is located. The health care providers must report all cases of giardiasis to the local health officer having jurisdiction over the locality in which the patient lives.

C. Local Department of Health Reporting and Follow-Up Responsibilities

1. Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that each local health officer must report the occurrence of any case of giardiasis, as defined by the reporting criteria in Section 2 A above. Current requirements are that cases be reported to the NJDHSS IZDP using the [CDS-1](#) form. A report can be filed electronically over the Internet using the confidential and secure CDRS.

2. Case Investigation

- a. It is the local health officer's responsibility to complete the [CDS-1](#) form by interviewing the patient and others who may be able to provide pertinent information to rule out a possible outbreak. Much of the information can be obtained from the patient's healthcare provider or the medical record.
- b. Use the following guidelines in completing the form and conducting the investigation:
 - 1) Accurately record the demographic information, date of symptom onset, symptoms, and medical information.
 - 2) When asking about exposure history (food, travel, activities, etc.), use the incubation period range for giardiasis (3–28 days). Specifically, focus on the period beginning a minimum of 3 days before the symptoms' onset date back to no more than 28 days before onset.
 - 3) If possible, record any restaurants at which the patient ate, including food item(s) such as raw salads and date(s) consumed.
 - 4) Ask questions about travel history and outdoor activities to help identify other potential exposure sources.
 - 5) Ask questions about water supply and if the patient drank any untreated water, because giardiasis may be acquired through water consumption.
 - 6) Ask questions regarding household/close contacts, pet or other animal contact. Determine whether the patient attends or works at a daycare facility and/or is a foodhandler. These questions are necessary to examine the patient's risk of having acquired the illness from, or potential for transmitting it to, these contacts. These questions are also useful to classify a case as sporadic, or part of household or institutional cluster or outbreak. Enter the collected information into the "Supporting Clinical Information" section or use the backside of the CDS-1 form.
 - 7) If there have been several attempts to obtain patient information (*e.g.*, the patient or healthcare provider does not return calls or does not respond to a letter, or the patient refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Please note on the form the reason why it could not be filled out completely. **If CDRS is used to report, enter collected information into the "Comments" section.**

After completing the form, it should be mailed (in an envelope marked "Confidential") to the NJDHSS IZDP, or the report can be filed electronically over the Internet using the confidential and secure CDRS. The mailing address is:

NJDHSS
Division of Epidemiology, Environmental and Occupational Health
Infectious and Zoonotic Diseases Program
P.O.Box 369
Trenton, NJ 08625-0369

- c. Institution of disease control measures is an integral part of the case investigation. It is the health officer's responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4, "Controlling Further Spread."

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

The patient should be isolated under enteric precautions. Articles soiled with feces should be disinfected. Food handlers with giardiasis must be excluded from work.

Note: A case of giardiasis is defined by the reporting criteria in Section 2 A of this chapter.

Minimum Period of Isolation of Patient

After diarrhea has resolved, foodhandling facility employees may only return to work after producing **one (1)** negative stool specimen. If a case has been treated with an antimicrobial, the stool specimen shall not be submitted until at least 48 hours after cessation of therapy. **In outbreak circumstances, a second consecutive negative stool specimen (collected no less than 24 hrs apart) may be required prior to returning to work.**

Minimum Period of Quarantine of Contacts

Contacts with diarrhea who are foodhandling facility employees shall be considered the same as a case and handled in the same fashion. No restrictions otherwise.

Note: A foodhandler is any person directly preparing or handling food. This can include a patient care or childcare provider.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare

Since giardiasis is often transmitted person-to-person through fecal-oral transmission, it is extremely important to carefully follow up on cases of giardiasis in a daycare setting. General recommendations include:

- Children with giardiasis who have diarrhea should be excluded until their diarrhea has resolved.
- Children with giardiasis who have no diarrhea and are otherwise not ill may remain in the program only if special precautions are taken.
- Since most staff in child care programs are considered foodhandlers, those with *Giardia* in their stools (symptomatic or not) can remain on site, but must not prepare food or feed children until their diarrhea has resolved and have **one (1)** negative stool test (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given).

School

Since giardiasis is often transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of giardiasis in a school setting. General recommendations include:

- Students or staff with giardiasis who have diarrhea should be excluded until their diarrhea has resolved.
- Students or staff with giardiasis, who do not handle food, have no diarrhea or mild diarrhea and are not otherwise sick, may remain in school if special precautions are taken.
- Students or staff who handle food and have giardiasis infection (symptomatic or not), must not prepare food until their diarrhea has resolved and they have **one (1)** negative stool test (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given).

Residential Programs

Actions taken in response to a case of giardiasis in a community residential program will depend on the type of program and the level of functioning of the residents.

In **long-term care facilities**, residents with giardiasis should be placed on standard (including enteric) precautions until their symptoms subside **and** they test negative for *Giardia*. Staff members who give direct patient care (*e.g.*, feed patients, give mouth or denture care or give medications) are considered foodhandlers and are subject to foodhandler restrictions. See Section 4 A above. In addition, staff members with giardiasis who are not foodhandlers should not work until their diarrhea has resolved.

In **residential facilities for the developmentally** disabled, staff and clients with giardiasis must refrain from handling or preparing food for other residents until their diarrhea has subsided and they have **one (1)** negative stool test for *Giardia* (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). In addition, staff members with giardiasis who are not foodhandlers should not work until their diarrhea has resolved.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of giardiasis in city/town is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle (such as water, food or association with a daycare center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the NJDHSS IZDP at 609.588.7500. The Program staff can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several jurisdictions and therefore be difficult to identify at a local level.

D. Preventive Measures

Personal Preventive Measures/Education

Educate families, personnel and residents of institutions, especially adult personnel of day care centers, in personal hygiene, including the following recommendations:

- Always wash hands thoroughly with soap and water before eating or preparing food, as well as after using the toilet and after changing diapers.
- In daycare settings, dispose of feces in a sanitary manner.
- When caring for person with diarrhea, scrub your and their hands with plenty of soap and water after cleaning the bathroom, helping persons use the toilet, or changing diapers, soiled clothes, or soiled sheets.
- When hiking or camping, be aware of the risks of drinking water from streams or lakes. Bringing water to a full, rolling boil is sufficient to kill *Giardia*. Several commercial filters are also available that remove *Giardia* cysts. Additionally, some chemical disinfectants are effective against *Giardia*.
- Avoid sexual practices that may involve direct contact with feces. Latex barrier protection should be emphasized as a way to prevent the spread of *Giardia* to case's sexual partners as well as being a way to prevent the exposure to and transmission of other pathogens.

Waterborne Outbreaks

- Protect public water supplies against contamination with human and animal feces.
- Adequately filter or chlorinate water from surface water sources (e.g., lakes, rivers, streams) before drinking.

International Travel

Travelers to developing countries should:

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than uncarbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water. Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Avoid foods and beverages from street vendors.

Note: For more information regarding international travel, contact the [CDC's Traveler's Health Office](http://www.cdc.gov/travel) at 877.394.8747 or through the Internet at <<http://www.cdc.gov/travel>>.

ADDITIONAL INFORMATION

A [Giardiasis Fact Sheet](http://www.state.nj.us/health) can be obtained at the NJDHSS website at <<http://www.state.nj.us/health>>.

The formal CDC surveillance case definition for giardiasis is the same as the criteria outlined in Section 2 A of this chapter. CDC case definitions are used by state health departments and CDC to maintain uniform standards for national reporting. For reporting to the NJDHSS, always refer to the criteria in Section 2 A.

REFERENCES

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